

MONTANA DIABETES SURVEILLANCE & CLINICAL COMMUNICATION



Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
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METABOLIC SYNDROME AND ITS COMPONENTS IN MONTANA

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BACKGROUND:

Sometimes termed the “deadly quartet” upper body obesity, glucose intolerance, dyslipidemia, and hypertension are all significant cardiovascular risk factors, which tend to cluster in individuals with insulin resistance.¹ This cluster of risk factors for both diabetes and heart disease has recently been recognized officially and assigned the ICD-9-CM diagnosis code 277.7.² A number of epidemiologic studies have described high insulin levels and decreased insulin sensitivity associated with hypertension, hypertriglyceridemia, decreased HDL cholesterol, glucose intolerance (impaired glucose tolerance or diabetes) and obesity.³ The newest report from the National Cholesterol Education Program highlights the importance of recognizing and treating individuals with the metabolic syndrome to prevent cardiovascular disease.⁴ And the recently published *Diabetes Prevention Program* showed that lifestyle changes could also reduce the progression from impaired glucose tolerance to overt diabetes.⁵ Thus recognition of the metabolic syndrome is not just a subject for epidemiologic analyses, but it is also the first step in an integral approach to the cluster of conditions for which the cornerstones of therapy are weight management and physical activity.

Recently the Centers for Disease Control and Prevention published estimates of the prevalence of the metabolic syndrome using data from NHANES (III).⁶ Participants having three or more of the following criteria were defined as having the metabolic syndrome:

- ◆ Abdominal obesity: waist circumference >102 cm in men and >88 cm in women
- ◆ Hypertriglyceridemia: ≥ 150 mg/dl
- ◆ Low HDL: <40mg/dl in men and <50 mg/dl in women
- ◆ High blood pressure: $\geq 130/85$ mm Hg or currently using antihypertensive medication
- ◆ High fasting glucose: ≥ 110 mg/dl or currently using insulin or oral agents for diabetes

Overall, the age-adjusted prevalence of dysmetabolic syndrome nationally was 23.7%.

This report provides county level estimates of the numbers of Montanans with metabolic syndrome based on the national prevalence estimate. The number of adult Montanans with diagnosed diabetes, by county, based on the Montana Behavioral Risk Factor Surveillance System (BRFSS) survey is also included.

METHODS:

The Montana DPHHS has conducted the BRFSS telephone survey of adult Montanans aged ≥ 18 years since 1984. The survey questions include demographic information, behavioral risk factors, disease status, and health care utilization. For 2000, the number of adult Montanans surveyed was 3,020.

To assess diabetes status, BRFSS survey respondents were asked, “Have you ever been told by a doctor that you have diabetes?” To assess the prevalence of obesity each respondent was asked to report his or her weight and height. Obesity was calculated using self-reported weight and height and defined as a body mass index ≥ 30.0 kg/m².

Estimates of the number of adult Montanans with metabolic syndrome were calculated using the age adjusted prevalence rate nationally (23.7%). The number of adult Montanans aged 18 years and older with diagnosed diabetes (4.9%), and who were obese (15.9%) was calculated using statewide 2000 prevalence estimates from the Montana BRFSS.⁷ The Montana County population was based on estimates from the 2000 census.⁸

For 1999, 1,798 adult Montanans were surveyed. To assess the prevalence of high blood pressure, 1999 BRFSS survey respondents were asked, “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?” Two questions were asked of 1999 BRFSS survey respondents to assess high cholesterol prevalence. First, “Have you ever had your blood cholesterol checked?” and second, “Have you ever been told by a doctor or other health professional that your blood cholesterol is high?” In 1999, 23.2% of adult Montanans had been told at some time by a health care professional that their blood pressure was high. In addition, 30.5% of Montana adults reported that they had ever been told by a health professional that their blood cholesterol was high given that they ever had a blood cholesterol checked.⁹

RESULTS:

Overall, in 2000, the estimated number of adult Montanans with metabolic syndrome was 159,296 (Table 1). The estimated number with diagnosed diabetes, a component of the metabolic syndrome, was 32,935. Estimates of the numbers of adult Montanans with diabetes and metabolic syndrome, by county, were calculated and displayed in Table 1.

Another component of metabolic syndrome is obesity. The estimated number of obese adult Montanans was 106,869 (data not shown).

Two additional components of the metabolic syndrome include hypertension and dyslipidemia (high triglycerides and low HDL). We used a self-reported diagnosis of hypertension to estimate the prevalence of hypertension. Because data about lipids from the BRFSS did not include specific information about triglycerides or HDL, we used “high cholesterol” from BRFSS as a surrogate for dyslipidemia. Based on the 1999 BRFSS prevalence data for these two conditions, the estimated number of Montana adults with high blood pressure was 155,935 and with high cholesterol 205,001 (data not shown).

Table 1. Estimates of the number of adult Montanans with diagnosed diabetes and metabolic syndrome, by County, 2000.

COUNTIES	POPULATION ESTIMATE	ESTIMATED NUMBER OF ADULTS WITH DIAGNOSED DIABETES	ESTIMATED NUMBER OF ADULTS WITH METABOLIC SYNDROME	TOTAL
Beaverhead	6,942	340	1,645	1,985
Big Horn	8,137	399	1,928	2,327
Blaine	4,722	231	1,119	1,350
Broadwater	3,280	161	777	938
Carbon	7,259	356	1,720	2,076
Carter	999	49	237	286
Cascade	59,445	2,913	14,088	17,001
Chouteau	4,249	208	1,007	1,215
Custer	8,757	429	2,075	2,505
Daniels	1,571	77	372	449
Dawson	6,963	341	1,650	1,991
Deer Lodge	7,295	357	1,729	2,086
Fallon	2,113	104	501	604
Fergus	8,974	440	2,127	2,567
Flathead	55,184	2,704	13,079	15,783
Gallatin	52,932	2,594	12,545	15,139
Garfield	966	47	229	276
Glacier	8,623	423	2,044	2,466
Golden Valley	754	37	179	216
Granite	2,144	105	508	613
Hill	11,966	586	2,836	3,422

Table 1. (continued) Estimates of the number of adult Montanans with diagnosed diabetes and metabolic syndrome, by County, 2000.

COUNTIES	POPULATION ESTIMATE	ESTIMATED NUMBER OF ADULTS WITH DIAGNOSED DIABETES	ESTIMATED NUMBER OF ADULTS WITH METABOLIC SYNDROME	TOTAL
Jefferson	7,251	355	1,718	2,074
Judith Basin	1,705	84	404	488
Lake	19,067	934	4,519	5,453
Lewis and Clark	41,448	2,031	9,823	11,854
Liberty	1,601	78	379	458
Lincoln	14,065	689	3,333	4,023
Madison	5,281	259	1,252	1,510
McCone	1,486	73	352	425
Meagher	1,449	71	343	414
Mineral	2,942	144	697	841
Missoula	73,885	3,620	17,511	21,131
Musselshell	3,446	169	817	986
Park	11,999	588	2,844	3,432
Petroleum	365	18	87	104
Phillips	3,345	164	793	957
Pondera	4,524	222	1,072	1,294
Powder River	1,364	67	323	390
Powell	5,655	277	1,340	1,617
Prairie	975	48	231	279
Ravalli	26,839	1,315	6,361	7,676
Richland	7,006	343	1,660	2,004
Roosevelt	6,948	340	1,647	1,987
Rosebud	6,240	306	1,479	1,785
Sanders	7,794	382	1,847	2,229
Sheridan	3,164	155	750	905
Silverbow	26,407	1,294	6,258	7,552
Stillwater	6,124	300	1,451	1,751
Sweet Grass	2,672	131	633	764
Teton	4,688	230	1,111	1,341
Toole	3,922	192	930	1,122
Treasure	622	30	147	178
Valley	5,747	282	1,362	1,644
Wheatland	1,653	81	392	473
Wibaux	792	39	188	227
Yellowstone	96,387	4,723	22,844	27,567
Total	672,133	32,935	159,296	192,230

LIMITATIONS:

There are a number of limitations to these analyses. First, the national estimate of metabolic syndrome was used to estimate the number of adult Montanans with this condition. The actual number of adult Montanans with this condition is unknown and may be higher or lower than the national prevalence estimate. Second, self-reported information from the Montana BRFSS was used to estimate the number of adults with diagnosed diabetes and obesity. Previous studies have found that self-reported diagnoses of diabetes are reliable.¹⁰ Although the definition of the metabolic syndrome does not include high cholesterol, we have used a history of high cholesterol to indicate dyslipidemia, which may also include low HDL cholesterol and high triglycerides. Previous studies, however, have found that self-reported weight is underestimated, therefore our estimates of obesity are likely underestimated.¹¹ Third, households without telephones were not included in the Montana BRFSS survey. Previous studies have found that adults living in households without telephones are more likely to have a higher prevalence of risk factors for chronic conditions.¹² Finally,

statewide prevalence estimates from the Montana BRFSS, were used to calculate the number of adult Montanans with diabetes by county. The actual prevalence of this condition could vary from the estimates provided here, particularly for counties with large American Indian communities, where the prevalence of diabetes is approximately two-fold higher.

CONCLUSIONS:

Using the definition of metabolic syndrome the CDC estimated that approximately 24% of U.S. adults had this condition.⁶ The implications of the findings are potentially serious for Montana with the increasing levels of obesity and physical inactivity, which are occurring both nationally and here in Montana. Estimates of the metabolic syndrome and its components, by county, present a compelling challenge to the medical community, the public health infrastructure and all Montanans.

If you would like a copy of Table 1 in spreadsheet format please contact Susan Day at the Montana Diabetes Project (406-444-6677, sday@state.mt.us).

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UPCOMING EVENTS FOR PERSONS LIVING WITH DIABETES AND THEIR FAMILIES:

The American Diabetes Association will be having their annual Diabetes EXPOs for persons living with diabetes and their family members.

ADA Diabetes EXPOs
Saturday, November 9, 2002
10:00 a.m. - 4:00 p.m.
Hoilday Inn Parkside, Missoula

Saturday, November 16, 2002
10:00 a.m. - 4:00 p.m.
Grand Montana Hoilday Inn, Billings

The EXPO costs \$5 per person or \$8 for two adult family members and children under 18 are admitted free with an adult. Scholarships available. To register or for more information visit or call the ADA at 3203 3rd Avenue North, Suite 203, Billings, Montana 59101, 1/800-766-8596 or 406-256-0616.

HEALTH PROFESSIONAL CONFERENCE
ON DIABETES - SAVE THE DATE:

The annual diabetes conference for health professionals is planned for October 18-19, 2002 at the Rock Creek Resort in Red Lodge, Montana. Save the date for this exciting meeting!!

RESOURCES ON DIABETES FOR SCHOOLS
AND FAMILIES WITH CHILDREN LIVING
WITH DIABETES:

The Montana Diabetes Project is developing a resource guide for teachers, school nurses, and other school personnel that provides useful information and tips on working with children with diabetes and their families. A resource guide for families will also be available. These materials should be available by August 2002. Please contact Susan Day at the Montana Diabetes Project (406-444-6677, sday@state.mt.us) to request a copy of these materials.

WHAT IS THE MONTANA DIABETES PROJECT AND HOW CAN WE BE CONTACTED:

The Montana Diabetes Project is funded through a cooperative agreement with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32/CCU815663-04). The mission of the Diabetes Project is to reduce the burden of diabetes and its complications among Montanans. Our web page can be accessed at <http://ahec.msu.montana.edu/diabetes/default.htm>.

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